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THOMAS P. STAFFORD  
1006 Cameron Street  
Alexandria, VA 22314

June 6, 1994

Dr. Bradford Parkinson  
Chairman, National Aeronautics and  
Space Administration Advisory Council  
National Aeronautics and Space Administration  
Washington, DC 20546-0001

Dear Dr. Parkinson:

On May 24 and 25, I convened the first meeting of the NASA Advisory Council Task Force on the Shuttle-Mir Rendezvous and Docking Missions at the Johnson Space Center (JSC). The minutes for this meeting and the names of those Task Force members who participated are enclosed.

It is the Task Force's conclusion that a great deal of work has gone into the preparations for the first two missions, STS-71 and STS-74. It was quite evident that planning for these Shuttle-Mir missions has been extensive and that a high level of dedication and commitment to this effort exists throughout the organizations involved. Also clear was the critical role that Phase 1 will play in preparing for the development, construction, operation, and utilization of the International Space Station Alpha.

Based on these initial briefings and Task Force discussions, we would like to make the following immediate recommendations:

- At a minimum, the mission commander and payload commander for all subsequent Shuttle-Mir missions should be named at least 18 months in advance of the scheduled launch date.
- In order to derive early operational experience in advance of the first Mir docking mission, the primary objective of STS-63 should be Mir rendezvous and proximity operations.
- If at all possible, the launch date for STS-63 should be moved forward.

During the course of the initial briefings a number of additional issues and questions were raised which the Task Force intends to explore further. Towards that end, I have established four working groups composed of Task Force members and technical advisors. Each working group will collect additional information regarding the issues in its particular area, review that information, and report its initial findings and recommendations at our next meeting, tentatively scheduled for 12 and 13 July. Following that meeting, I will provide you with a detailed report and additional recommendations.

The four working groups and their purpose are as follows:

#### Management Working Group

The complexity of the International Space Station Alpha development effort demands close cooperation among the ISSA Program, the Shuttle Program, and the Johnson Space Center as well as a host of other NASA organizations and facilities if it is to be successful. The purpose of the Management Working Group is to examine the current management structure of the overall effort, review proposals for strengthening that structure, and provide specific recommendations on the best approach for improving it. In that process, careful consideration will be given to the following:

- Chain of command
  - Role of the Mission Director
- Accountability
  - Milestones
  - Mission success
  - Funding
- Russian interface

#### Phase 1 Working Group

The Phase 1 program offers a unique opportunity to achieve objectives in several critical areas, particularly long duration science and ISSA risk mitigation and technology development. Evaluating and prioritizing opportunities in these areas across the ten missions of the Shuttle-Mir program are complex tasks which require a clear vision of the ultimate objectives and a thorough understanding of the constraints.

#### Crew Systems, Training, and Operations Working Group

The Shuttle-Mir missions will involve an unprecedented level of cooperation between the U.S. and Russian space programs. They will also require a carefully orchestrated mission sequence and ten rendezvous and docking operations. The purpose of this working group is to examine planning for the Shuttle-Mir missions in the areas of crew systems, training, and operations; provide recommendations on ways to improve that process; and offer an independent assessment of related technical issues.

#### Vehicle Systems Working Group

When *Atlantis* first docks with the Mir-1 space station on the STS-71 mission, it will represent the success of a joint engineering and safety certification process involving a wide array of civil servants and contractors from both the U.S. and Russia. This cooperation will continue through the subsequent nine Shuttle-Mir flights. The Vehicle Systems Working Group will examine the efforts to date in this area; provide recommendations on ways to improve the planning and implementation process; and offer an independent assessment of related technical issues.

Given the dedication of the Task Force members and technical advisors as well as the wealth of knowledge and experience they represent, I feel confident that the working groups will provide a wide range of valuable insights at the July meeting of the Task Force. As mentioned above, the information provided by the working groups will be incorporated into a detailed report to be provided to you shortly following the meeting.

In conclusion, I would like to call to your attention the outstanding support the Task Force has received from the Johnson Space Center, the International Space Station Alpha Program, and the Space Shuttle Program. This is particularly appreciated given the busy schedules of the many individuals who contributed to the meetings.

Sincerely,

A handwritten signature in cursive script, reading "Thomas P. Stafford". The signature is written in dark ink and is positioned above the printed name and title.

Thomas P. Stafford  
Lt. General, USAF(Ret.)

cc:

NASA/Code A/Mr. Goldin  
NASA/Code M/Gen. Pearson  
NASA/Code I/Ms. A. Accola

NASA ADVISORY COUNCIL  
 TASK FORCE ON THE SHUTTLE-MIR  
 RENDEZVOUS AND DOCKING MISSIONS  
 Initial Briefing  
 Lyndon B. Johnson Space Center  
 Building 1, Room 966  
 24 - 25 May 1994  
 Meeting Minutes

Tuesday, 24 May 1994		
9:05 - 9:10	Welcoming Remarks	Dr. Carolyn Huntoon JSC Center Director
9:10 - 10:20	Phase 1 Overview <ul style="list-style-type: none"> <li>• Background (International Agreements)</li> <li>• Phase 1 Scope</li> <li>• Goals of Phase 1</li> <li>• Joint Working Group Structure</li> <li>• Cooperative and Contractual Arrangements</li> <li>• Program Schedule</li> </ul>	Mr. James Nise International Space Station Alpha (ISSA) Program Office
10:30 - 11:25	Mission Overviews (STS-63, STS-71, and STS-74) <ul style="list-style-type: none"> <li>• Mission Objectives</li> <li>• Mission Summary</li> <li>• Flight Summary</li> </ul>	Mr. David S. Grissom Space Shuttle Program Office
11:25 - 12:00	STS-71 Science Overview <ul style="list-style-type: none"> <li>• Joint Science Working Group</li> <li>• Priorities</li> <li>• Investigations</li> <li>• Disciplines</li> <li>• Hardware</li> <li>• End of Mission Countermeasures</li> <li>• Training</li> <li>• Timeline</li> <li>• Post-Flight Activity Planning</li> </ul>	Dr. Peggy Whitson JSC Space and Life Sciences Directorate
12:15 - 3:10	Orbiter Docking System <ul style="list-style-type: none"> <li>• Requirements Highlights</li> <li>• Hardware Overview</li> <li>• STS-71 Program Status</li> <li>• STS-74 Program Status</li> <li>• Androgynous Peripheral Assembly System (APAS) Docking Mechanism Overview</li> </ul>	Mr. Stuart McClung JSC Orbiter and GFE Projects Office  Mr. John McManamen JSC Engineering Directorate

Wednesday, 25 May 1994

8:10 - 10:00	<p>Systems Integration</p> <ul style="list-style-type: none"><li>• Roles and Responsibilities</li><li>• STS-63 and STS-71 Overview and Status</li><li>• Joint Engineering Analysis Approach</li><li>• On-Orbit Engineering Areas<ul style="list-style-type: none"><li>- Mated Flight Control</li><li>- Loads and Dynamics</li><li>- Thermal Control</li><li>- Life Support Systems</li><li>- Avionics</li><li>- Rendezvous and Docking Aids</li></ul></li><li>• STS-74 Overview and Status</li></ul>	<p>Mr. Gregory Lange Space Shuttle Integration and Operations Office</p> <p>Mr. Donald Noah Space Shuttle Integration and Operations Office</p>
10:00 - 11:10	<p>Operations</p> <ul style="list-style-type: none"><li>• Flight Design Overview</li><li>• Mir Approach Demonstration DTO</li><li>• +Rbar Approach</li><li>• New Tools for Rendezvous and Docking</li><li>• Proximity Operations</li><li>• Organization</li><li>• Flight Operations</li><li>• Flight Rules</li><li>• Attitude Planning</li><li>• Communication and Interaction Between Mission Control Centers</li><li>• Schedules</li></ul>	<p>Mr. Gary Coen JSC Mission Operations Directorate</p>
11:30 - 12:15	<p>Crew Exchange and Training</p> <ul style="list-style-type: none"><li>• Crew Exchange and Training Working Group<ul style="list-style-type: none"><li>- Functions</li><li>- Members</li><li>- Interfaces</li></ul></li><li>• Documentation</li><li>• Status</li><li>• Training Challenges</li><li>• Training Strategy</li><li>• Cosmonaut Training Plan</li><li>• Comparison of U.S. and Russian Training</li><li>• Bailout/Egress</li><li>• Docking Mission Training</li><li>• Crew Tasks During Prox Ops/Docking</li></ul>	<p>Mr. Steven Nagel JSC Flight Crew Operations Directorate</p> <p>Mr. Tommy Capps JSC Mission Operations Directorate</p> <p>Mr. Steven Nagel JSC Flight Crew Operations Directorate</p>
12:30 - 1:00	<p>Safety</p> <ul style="list-style-type: none"><li>• Safety Assurance Working Group</li><li>• Safety Assurance Policy and Guidelines</li><li>• Shuttle/Mir Program Safety Documentation Development</li><li>• Safety Requirements</li><li>• Analysis of Off-Nominal Situations and Hazardous Conditions</li><li>• Readiness to Support the Mission</li><li>• Schedule</li></ul>	<p>Ms. Charlene Sarver JSC Mission Operations Directorate</p>

**TASK FORCE MEMBERS AND TECHNICAL ADVISORS  
ATTENDING THE 24 - 25 MAY MEETING**

Team Members

Lt. Gen. Thomas P. Stafford, USAF (Ret.), Chairman  
Stafford, Burke and Hecker, Inc.

Col. James C. Adamson, USA (Ret.)  
President, Monarch Precision

Dr. Michael A. Greenfield  
Deputy Associate Administrator, NASA Office of Safety and Mission Assurance

Maj. Gen. Ralph Jacobson, USAF (Ret.)  
President and CEO, The Charles Stark Draper Laboratories

Mr. James M. Heflin, Jr.  
Flight Director Office, NASA Lyndon B. Johnson Space Center

Dr. Arnauld Nicogossian  
Deputy Associate Administrator, NASA Office of Life and Microgravity Sciences and Applications

Mr. Chester A. Vaughan  
Chief, Propulsion and Power Division, NASA Lyndon B. Johnson Space Center

Capt. John Young, USN (Ret.)  
Special Assistant for Engineering, Operations, and Safety, Office of the Director,  
NASA Lyndon B. Johnson Space Center

Executive Secretary

Mr. William L. Vantine

Technical Advisors

Maj. Gen. Joe H. Engle, USAF (Ret.)  
President, Engle Technologies, Inc.

Mr. Glynn Lunney  
President, Rockwell Space Operations Company